UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/750,581	12/29/2003	Robert E. Higashi	H0005015-0760(1100.123710	8573

128 7590 09/24/2007

HONEYWELL INTERNATIONAL INC.
101 COLUMBIA ROAD
P O BOX 2245
MORRISTOWN, NJ 07962-2245

EXAMINER	
ECHELMEYER, ALIX ELIZABETH	
ART UNIT	**PAPER NUMBER**
1745	

MAIL DATE	DELIVERY MODE
09/24/2007	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/750,581	HIGASHI ET AL.	
	Examiner	Art Unit	
	Alix Elizabeth Echelmeyer	1745	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *05 July 2007*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *29-34,36,37,39-56 and 58-60* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *29-34,36,37,39-56 and 58-60* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date *5-4-07*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Response to Amendment

1. This Office Action is in response the amendment filed July 5, 2007. Claims 29, 36, 37, 54, 56, 58 and 59 have been amended. Claims 35, 38 and 57 have been cancelled. Claims 29-34, 36, 37, 39-56 and 58-60 are pending and are rejected finally for the reasons given below.

Information Disclosure Statement

2. The Information Disclosure Statement filed May 4, 2007 has been considered.

Claim Interpretation

3. Claims 29-34, 36, 37, 39-56 and 58-60 are directed to electrodes for a fuel cell, wherein the electrodes have apertures, and a proton exchange membrane is sandwiched between the apertures. The instant specification teaches that the catalyst layers are formed on the membrane, and not on the so-called electrodes (Claim 2, [0029], [0031], [0039], etc. of the instant specification, see US Pre-Grant Publication 2005/0142410). For the purposes of examination, the electrodes as claimed will be interpreted to be current collectors, since the catalyst layer is already contained in the membrane.

4. Claims 29-34, 36, 37, 38-46, 54-56 and 58-60 are drawn to method claims. The claims are directed, for example, to "forming a first aperture ..." and "providing" various

components. Since an assembled fuel cell having the structural requirements of the method claims would inherently have been formed by "providing" those components, a fuel cell having the structure required by the method claims is interpreted to having been formed by that method.

Claim Rejections - 35 USC § 102

5. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

6. Claims 29, 30, 33, 34 and 36-48 are rejected under 35 U.S.C. 102(b) as being anticipated by Pratt et al. (US Patent 6,127,058).

With regard to claim 29, Pratt et al. teach a planar fuel cell having a membrane electrode assembly sandwiched between two current collectors (abstract). Pratt et al. further teach that the assembly is held together by an adhesive (column 5 lines 9-13). In Figure 4, it is seen that the membrane electrode assembly contains electrodes that are separated by an aperture, if one considers that the electrodes were all one sheet and then cut apart to form individual electrodes. The current collecting assembly (44, 45, 46) covers the areas where the electrodes do not cover the membrane, or aperture.

As for claims 30 and 48, Pratt et al. teach that the membrane is coated on both sides with a catalyst (column 5 lines 6-8).

Regarding claims 33-35, 42 and 43, in one embodiment Pratt et al. teach metal current collectors on a plastic film (column 5 lines 13-29). The current collector is inherently conductive since it must conduct electricity in order for the fuel cell to function.

Regarding claim 37, the current collectors are conductive layers provided on the plastic film. In this case, the electrode is the plastic film, which is nonconductive, and the metal current collectors are conductive, so the current collecting layer, or "electrode layer" of the instant claims, is both conductive, because of the metal current collectors, and nonconductive, because of the plastic film.

As for claims 36 and 47, the adhesive layer discussed above must be conductive in order for the fuel cell to produce electricity, so it will be considered as a conductive layer. The layer would be provided after the apertures were formed in the current collecting layer (column 5 lines 9-13).

As for claim 39, the adhesive layer covers part of the aperture surfaces, as just discussed and as seen in Figure 4.

Regarding claims 40, 41, 44 and 45, the conductive layer would inherently extend through the apertures since it must conduct electricity out of the fuel cell.

Claim Rejections - 35 USC § 103

7. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and

the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

8. Claims 54-56 and 58-60 are rejected under 35 U.S.C. 103(a) as being unpatentable over Pratt et al.

The teachings of Pratt et al. as discussed above are incorporated herein.

Pratt et al. teach the fuel cell having apertures as discussed above, but fail to teach that a conductive feed-through through the first material. Pratt et al. do teach the first material (44, 45 in Figure 4) and electrical contacts (46), but the contacts are only on one side of the non-conduction portion of the current collector.

As for claim 55, Pratt et al. teach that one or several fuel cell assemblies may be provided (column 5 lines 29-37).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to extend the contacts (46) through the non-conduction portion (44), if the electrical connection was required by the device in which the cell was being used to be arranged on a surface on the outside of the fuel cell. It has been held that rearranging parts of an invention involves only routine skill in the art. MPEP 2144.04 (VI C).

9. Claims 31 and 32 are rejected under 35 U.S.C. 103(a) as being unpatentable over Pratt et al. in view of Stanley et al. (US Pre-Grant Publication 2004/0053100).

The teachings of Pratt et al. as discussed above are incorporated herein.

Pratt et al. teach a method for providing a membrane electrode assembly but fail to teach the instantly claimed membrane and catalyst materials.

Stanley et al. teach a membrane made of polytetrafluroethylene and a perfluorosulfonic acid ([0034]). The catalyst of Stanley et al. may be platinum supported on carbon black ([0066]).

Stanley et al. teach that it is conventional to use a solid polymer electrolyte, such as one made of polytetrafluroethylene and a perfluorosulfonic acid, since it is dimensionally stable and inert ([0007], [0034]).

Stanley et al. further teach that platinum supported on carbon black is a conventionally recognized catalyst for enhancing reaction rate ([0007], [0066]).

It would have been desirable to form the membrane and catalyst of Pratt et al. with the materials taught by Stanley et al. since they would form a fuel cell that was dimensionally stable and inert, and enhanced the reaction.

Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to form the membrane and catalyst of Pratt et al. with the materials taught by Stanley et al. since they would form a fuel cell that was dimensionally stable and inert, and enhanced the reaction.

10. Claims 49-53 are rejected under 35 U.S.C. 103(a) as being unpatentable over Pratt et al. in view of Badding et al. (US Pre-Grant Publication 2002/0102450).

The teachings of Pratt et al. as discussed above are incorporated herein.

Pratt et al. teach a fuel cell assembly that is very thin (column 5 line 39).

Pratt et al. fail to teach the specifically claimed dimensions.

Badding et al. teach a fuel cell apparatus having thicknesses for various components of 0.1 to 50 microns, which is desired in order to provide a current path while overcoming the resistivity of various materials ([0052]).

It would have been desirable to create parts of the fuel cell of Pratt et al. as small as possible, such as in the dimensions of Badding et al., in order to create a fuel cell that was very thin but still functioned to overcome the resistivity of the materials used.

It has been held that discovering an optimum value of a result effective variable involves only routine skill in the art. MPEP 2144.05 (IIB).

Response to Arguments

11. Applicant's arguments filed July 5, 2007 have been fully considered but they are not persuasive.

Regarding Applicant's argument that Pratt et al. do not teach the method claims, this has been addressed above in the claim interpretation section. Since the structure of Pratt et al. matches the instantly claimed structure, and since all of the components would have been "formed", "provided", and "sandwiched", Pratt et al. inherently teach the method of forming the fuel cell. The examiner is not asserting that the fuel cell of Pratt et al. "could have" been made by the method, but it would have been made by the method, since it would not have been made by any other method.

The arguments concerning claims 29 and 54 relate to newly added limitations. These limitations are addressed in the above rejection.

Conclusion

12. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Alix Elizabeth Echelmeyer whose telephone number is 571-272-1101. The examiner can normally be reached on Mon-Fri 7-4:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Susy N. Tsang-Foster can be reached on 571-272-1293. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Alix Elizabeth Echelmeyer
Examiner
Art Unit 1745

aee

SUSY TSANG-FOSTER
PRIMARY EXAMINER